

## REMARKS

Claims 1, 3, 6-8, 10-12 and 14-16 have been amended. Several of the claims have been amended to provide proper antecedent basis, as appropriate, and to correct for minor typographical errors. Claims 1-17 remain in the application. Support for the amendments to the claims is identified herein below. No new matter has been added. This application has been carefully considered in connection with the Examiner's Action. Reconsideration, and allowance of the application, is respectfully requested.

### **Rejection under 35 U.S.C. §102**

Claim 1 recites a beam shaping method based on broadband antenna, comprising:

measuring a frequency of input signals of an antenna, the antenna comprising an antenna array, wherein the input signals can include signals with different frequencies, including an original frequency and a second frequency different from the original frequency;

determining an effective antenna aperture between elements of the antenna array according to a measured frequency, wherein determining includes re-sampling at the antenna elements to ensure that the antenna's effective aperture changes from a first effective aperture to a second effective aperture to keep a beam width of the antenna constant with the two frequencies;

computing a weight vector of each element of the antenna array to the input signals according to (i) the determined effective antenna aperture and (ii) a transmission function of the antenna array; and

multiplying each of the input signals with a corresponding one of said weight vector of each element of the antenna array to the input signals, combining them into beam signals with constant beam width and outputting the beam signals.

Support for the amendments to claim 1 (similarly, for claims 6, 10 and 14), can be found in the specification at least on page 2, lines 14-19; and page 5, lines 3-9.

Claims 1-17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hopwood (Pat. No. 5,726,662) or Evans (Pat. No. 4,743,911). With respect to claim 1, Applicant respectfully traverses this rejection for at least the following reasons.

The PTO provides in MPEP § 2131 that

*"[t]o anticipate a claim, the reference must teach every element of the claim...."*

Therefore, with respect to claim 1, to sustain this rejection the Hopwood or Evans references must contain all of the above claimed elements of the respective claims. However, contrary to the examiner's position that all elements are disclosed in the Hopwood and Evans references, the latter references do not disclose "... wherein *determining includes re-sampling* at the antenna elements *to ensure* that the antenna's *effective aperture changes* from a first effective aperture to a second effective aperture *to keep a beam width of the antenna constant* with the two frequencies; *computing a weight vector* of each element of the antenna array to the input signals *according to (i) the determined effective antenna aperture and (ii) a transmission function* of the antenna array ..." as is claimed in claim 1.

*In contrast*, the method and system of Hopwood teaches holding sub-array spacing constant as the frequency F is changed. (See Hopwood at col. 3, lines 54-57). The sub-array spacing corresponds to an effective aperture of the antenna. Accordingly, Hopwood does not teach or suggest a "... wherein *determining includes re-sampling* at the antenna elements *to ensure* that the antenna's *effective aperture changes* from a first effective aperture to a second effective aperture *to keep a beam width of the antenna constant* with the two frequencies; *computing a weight vector* of

each element of the antenna array to the input signals *according to (i) the determined effective antenna aperture and (ii) a transmission function of the antenna array ...*” as is claimed in claim 1 of the present application.

Furthermore, *in contrast*, while the system of Evans teaches a constant beamwidth antenna in which a frequency sensitive signal splitter divides the incoming signal from the radar transmitter into correction and basic components (See Evans at col. 4, lines 10-12), Evans does not teach or suggest a “...wherein *determining includes re-sampling* at the antenna elements *to ensure* that the antenna’s *effective aperture changes* from a first effective aperture to a second effective aperture *to keep a beam width of the antenna constant* with the two frequencies; *computing* a weight vector of each element of the antenna array to the input signals *according to (i) the determined effective antenna aperture and (ii) a transmission function of the antenna array ...*” as is claimed in claim 1 of the present application.

Therefore, the rejection is not supported by the Hopwood or Evans references and should be withdrawn.

Accordingly, claim 1 is allowable and an early formal notice thereof is requested. Dependent claims 2-5 depend from and further limit independent claim 1 and therefore are allowable as well.

With respect to Claim 6, the claim contains limitations similar to those of claim 1. Claim 6 is thus believed allowable over Hopwood or Evans, taken alone or in combination, for the reasons as stated herein with respect to claim 1. Accordingly, Claim 6 is allowable and an early formal notice thereof is requested. Dependent claims 7-9 depend from and further limit independent claim 6 and therefore are allowable as well.

With respect to Claim 10, the claim contains limitations similar to those of claim 1. Claim 10 is thus believed allowable over Hopwood or Evans, taken alone or in combination, for the reasons as stated herein with respect to claim 1. Accordingly, Claim 10 is allowable and an early formal notice thereof is requested. Dependent claims 11-13 depend from and further limit independent claim 10 and therefore are allowable as well.

With respect to Claim 14, the claim contains limitations similar to those of claim 1. Claim 14 is thus believed allowable over Hopwood or Evans, taken alone or in combination, for the reasons as stated herein with respect to claim 1. Accordingly, Claim 14 is allowable and an early formal notice thereof is requested. Dependent claims 15-17 depend from and further limit independent claim 14 and therefore are allowable as well.

Accordingly, the 35 U.S.C. § 102(b) rejection thereof has now been overcome.

### **Conclusion**

Except as indicated herein, the claims were not amended in order to address issues of patentability and Applicants respectfully reserve all rights they may have under the Doctrine of Equivalents. Applicants furthermore reserve their right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or a continuation application.

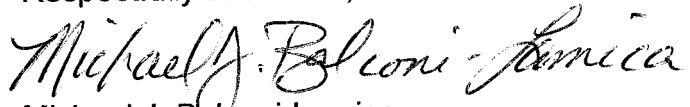
It is clear from all of the foregoing that independent claims 1, 6, 10 and 14 are in condition for allowance. Dependent claims (2-5), (7-9), (11-13), and (15-17) depend from and further limit independent claims 1, 6, 10, and 14, respectively, and therefore are allowable as well. The amendments herein are fully supported by the original

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specification and drawings as discussed herein; therefore, no new matter is introduced.  
Issuance of an early formal notice of allowance of claims 1-17 is requested.

Respectfully submitted,



Michael J. Balconi-Lamica  
Registration No. 34,291  
on behalf of David Barnes, Reg. No. 47,407

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Philips Electronics North America Corporation  
345 Scarborough Road  
Briarcliff Manor, New York 10510  
Telephone: 914-333-9693  
Facsimile: 914-332-0615  
File: CN030008US1

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